

WHAT IS CLAIMED:

1. An automatic tablet-cutting device comprising:
 - tablet-guide apparatus having a tablet-receiving portion and a tablet-guide portion along which a tablet is directed from the receiving portion to cutter apparatus;
 - 5 -tablet-alignment apparatus positioned with respect to the tablet-guide, the alignment apparatus comprising:
 - an alignment member having a tablet-contact surface spaced apart from the tablet-guide to form a cavity with a decreasing cross-section therebetween, the tablet-contact surface and tablet-guide coacting to orient the tablet with a
 - 10 primary axis substantially parallel to a first direction; and
 - at least one alignment element movably mounted to contact the oriented tablet and move the tablet into alignment for cutting at a cutting position; and
 - tablet-cutter apparatus positioned to contact the aligned tablet and cut the
 - 15 tablet substantially in half.
2. The device of claim 1 wherein the tablet-guide portion includes a guide surface in contact with the tablet.
3. The device of claim 2 wherein the guide surface comprises plural surface
- 20 portions and the guide surface has a v-shaped cross section.
4. The device of claim 2 wherein the guide surface is inclined.
5. The device of claim 2 wherein the alignment member is movably mounted
- 25 between at least an alignment position in which the tablet-contact surface and tablet-guide surfaces coact to orient the tablet with the primary axis substantially parallel to the first direction and a further position in which the tablet-contact surface is positioned out of contact with the tablet.

6. The device of claim 2 wherein the alignment member comprises:

-a cylindrically-shaped body mounted for rotation in a first direction, the body having a circumferential surface comprising the tablet contact surface, the body mounted so that body rotation in the first direction moves a tablet positioned against the tablet contact surface in the cavity thereby orienting the tablet; and

-a member mounted for movement in a second direction and positioned concentrically around at least a portion of the tablet-contact surface and having a tablet-contact portion, the member mounted so that rotation in the second direction moves the tablet-contact portion against the aligned tablet and moves the tablet to the cutter apparatus for cutting.

7. The device of claim 2 wherein the alignment member comprises a cylindrically-shaped body mounted for bi-directional rotation in first and second directions, the body having:

-a circumferential surface comprising the tablet contact surface;
-a cut-out portion along the surface having first and second surfaces forming a tablet-receiving groove; and

-rotation of the body in the first direction moves a tablet positioned against the tablet-contact surface in the cavity thereby orienting the tablet and rotation of the body in the second direction positions the oriented tablet in the groove with the first and second surfaces coacting to hold the aligned tablet and move the tablet to the cutter apparatus for cutting.

8. The device of claim 1 wherein the alignment apparatus includes first and second alignment elements each mounted for movement between a position in which the element is out of contact with the tablet and a further position in which the elements synchronously move together to contact the oriented tablet and move the tablet into alignment for cutting.

9. The device of claim 1 further including biasing apparatus positioned with respect to the tablet in the tablet-guide, said biasing apparatus providing a force against the tablet so that the tablet is firmly, but not crushingly, held for cutting by the cutter apparatus.

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10. The device of claim 1 wherein the cutter apparatus comprises:

-a rotary saw blade mounted for rotational movement to cut an aligned tablet;

and

-a motor operatively connected to the blade for rotating the blade.

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11. The device of claim 1 further including vacuum apparatus positioned with respect to the cutter apparatus, the vacuum apparatus including:

-air-flow apparatus positioned to move particulate containing air away from the cutter apparatus and through at least one filter; and

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-the at least one filter includes at least one surface removing the cut-tablet particulates.

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12. An automatic tablet-cutting device comprising:

-tablet-guide apparatus having a tablet-receiving portion and a tablet guide portion along which a tablet is directed from the receiving portion to cutter apparatus;

-tablet-alignment apparatus positioned with respect to the tablet-guide and

5 cutter apparatus, the alignment apparatus comprising:

-an alignment member having a tablet-contact surface spaced apart from the tablet guide to form a cavity with a decreasing cross-section therebetween, the tablet contact surface and tablet guide coacting to orient the tablet with a primary axis substantially parallel to a first direction; and

10 -at least one alignment element movably mounted to contact the oriented tablet and move the tablet into alignment for cutting at a cutting position; and

-tablet-cutter apparatus for cutting the aligned tablet, the cutter apparatus including a cutting surface movable between a first position in which the cutting surface is positioned out of contact with the tablet and a second position in which the
15 cutting surface cuts the tablet substantially in half.

13. The device of claim 12 wherein the tablet-guide is inclined.

14. The device of claim 13 wherein the tablet-guide includes at least one guide
20 surface configured to align the tablet primary axis in a direction substantially parallel with a tablet-guide axis.

15. The device of claim 14 wherein the guide surface comprises plural surfaces including a v-shaped cross section and the plural guide surfaces coact to
25 orient the tablet so that the tablet primary axis is substantially parallel to the tablet-guide axis.

16. The device of claim 12 wherein the tablet-guide further includes a tablet-guide portion onto which cut tablet portions are directed from the cutter apparatus to a
30 tablet-guide end.

17. The device of claim 15 wherein the alignment member is movably mounted between at least an alignment position in which the tablet-contact surface and tablet-guide surfaces coact to orient the tablet with the primary axis parallel to the first direction and a release position in which the tablet-contact surface is positioned out of contact with the tablet.

18. The device of claim 17 wherein the alignment member comprises:
-a support member movably mounted between at least the alignment and release positions;

-a body pivotally mounted on the support member, the body including the tablet-contact surface, an upstream end, a downstream end and attachment structure movably mounting the body to the support member along the body upstream end; and
-biasing apparatus acting against the body to urge the tablet-contact surface toward the tablet-guide surface so that, in the alignment position, the tablet is contacted for alignment by the tablet-contact surface and tablet-guide surfaces.

19. The device of claim 12 wherein the alignment apparatus includes first and second alignment elements each mounted for movement between a position in which the element is out of contact with the tablet and a further position in which the elements synchronously move together to contact the oriented tablet and move the tablet into alignment for cutting.

20. The device of claim 19 wherein:

- the cutter apparatus cutting surface is perpendicular to a tablet-guide axis;
- the first tablet-alignment element has an alignment portion mounted for movement at a position along the tablet-guide upstream of the cutter apparatus;
- 5 -the second tablet-alignment element has an alignment portion mounted for movement at a position along the tablet-guide downstream of the cutter apparatus; and further including:

-actuator apparatus operatively connected to the first and second tablet-alignment elements for moving such elements between at least:

- 10 -a first position in which the second element alignment portion is positioned in the guide and the first element alignment portion is positioned out of the guide;
- a second position in which the first and second element alignment portions are in the guide and are synchronously moved together along the tablet-guide axis to contact a tablet positioned between said portions thereby aligning the tablet
- 15 for cutting at the cutting position; and
- a third position in which at least the second element alignment portion is positioned out of the guide to avoid engagement with a tablet on the guide surface.

20 21. The device of claim 12 wherein the cutter apparatus comprises:

- a rotary saw blade including the cutting surface and the blade is mounted for movement between the first and second positions; and
- a motor operatively connected to the blade for rotating the blade.

25 22. The device of claim 21 wherein the blade has an axis perpendicular to a tablet-guide axis and the blade cuts the tablet along a tablet axis perpendicular to the tablet-guide axis.

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23. The device of claim 12 further comprising ejector apparatus positioned with respect to the cutter apparatus, the ejector apparatus comprising

-an ejector element movable between a ready position in which the element is out of contact with the tablet and an ejection position in which a contact portion
5 contacts cut tablet portions and urges such portions away from the cutter apparatus;
and

-an actuator coupled to the ejector element for moving the element between the ready and ejection positions.

10 24. The device of claim 12 further including vacuum apparatus positioned with respect to the cutter apparatus, the vacuum apparatus including:

-air-flow apparatus positioned to move particulate containing air away from the cutter apparatus and through at least one filter; and

15 -the at least one filter includes at least one surface removing the cut-tablet particulates.

25 25. A method of automatically cutting a tablet into tablet portions having substantially equal volume comprising the steps of:

-positioning the tablet along a tablet-guide;

20 -automatically orienting the tablet into an orientation in which a tablet first primary axis is parallel to a first direction;

-automatically moving the tablet in such orientation along the tablet-guide into alignment for cutting at a cutting position; and

-cutting the aligned tablet.

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26. The method of claim 25 wherein the automatic orienting step comprises:
-positioning the tablet on a tablet-guide surface along the tablet-guide
alignment position; and

5 -contacting the positioned tablet with a tablet-contact surface, said tablet-
contact surface being spaced apart from the tablet-guide surface and positioned to
form a cavity with a decreasing cross-section therebetween, the tablet-contact and
tablet-guide surfaces coacting to orient the tablet.

10 27. The method of claim 26 wherein the automatic moving step comprises
contacting the oriented tablet with spaced apart first and second alignment elements,
said alignment elements synchronously moving together to contact the oriented tablet
therebetween, the alignment elements coacting to move the tablet into alignment for
cutting at the cutting position.

15 28. The method of claim 25 further including the step of holding the aligned
tablet for cutting.

20 29. The method of claim 27 including the further step of ejecting cut tablet
portions from the cutting position.

30 30. The method of claim 25 wherein the cutting step comprises sawing the
tablet.

25 31. The method of claim 25 further including the step of removing cut tablet
particulates with a vacuum apparatus.

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32. An automatic tablet-cutting device comprising:

-a housing;

-tablet-guide apparatus positioned with respect to the housing, the tablet guide apparatus having a tablet-receiving portion and a tablet-guide surface along which a tablet is directed from the receiving portion to cutter apparatus;

-tablet-alignment apparatus positioned with respect to the tablet guide, the alignment apparatus comprising:

-an alignment member having a tablet-contact surface spaced apart from the tablet-guide to form a cavity with a decreasing cross-section therebetween, the tablet-contact surface and tablet-guide surface coacting to orient the tablet with a primary axis substantially parallel to a first direction; and

-first and second movable alignment elements movably mounted between at least a position in which the elements are out of contact with the tablet and a second position in which the alignment elements synchronously move together to contact the oriented tablet and move the tablet into alignment for cutting at a cutting position; and

-tablet-cutter apparatus positioned with respect to the tablet guide to contact the aligned tablet and cut the tablet substantially in half.

33. The device of claim 32 wherein the alignment member comprises:

-a support member movably mounted between at least an alignment position in which the alignment member is positioned to orient the tablet and a further position in which the alignment member is out of contact with the tablet;

-a body pivotally mounted on the support member, the body including the tablet-contact surface, an upstream end, a downstream end and attachment structure movably mounting the body to the support member along the body upstream end; and

-biasing apparatus acting against the body to urge the tablet-contact surface toward the tablet-guide surface so that, in the alignment position, the tablet is contacted for alignment by the tablet-contact surface and tablet-guide surfaces.

34. The device of claim 33 wherein the cutter apparatus comprises:

-a rotary saw blade mounted for rotational movement to cut an aligned tablet;

and

-a motor operatively connected to the blade for rotating the blade.

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35. The device of claim 32 wherein the alignment member comprises:

-a cylindrically-shaped body mounted for rotation in a first direction, the body having a circumferential surface comprising the tablet contact surface, the body mounted so that body rotation in the first direction moves a tablet positioned against the tablet contact surface in the cavity thereby orienting the tablet; and

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-a member mounted for movement in a second direction and positioned concentrically around at least a portion of the tablet-contact surface and having a tablet-contact portion, the member mounted so that rotation in the second direction moves the tablet-contact portion against the aligned tablet and moves the tablet to the cutter apparatus for cutting.

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36. The device of claim 32 wherein the alignment member comprises a cylindrically-shaped body mounted for bi-directional rotation in first and second directions, the body having:

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-a circumferential surface comprising the tablet contact surface;

-a cut-out portion along the surface having first and second surfaces forming a tablet-receiving groove; and

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-rotation of the body in the first direction moves a tablet positioned against the tablet-contact surface in the cavity thereby orienting the tablet and rotation of the body in the second direction positions the oriented tablet in the groove with the first and second surfaces coacting to hold the aligned tablet and move the tablet to the cutter apparatus for cutting.

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